

**DECISION
AND
FINDING OF NO SIGNIFICANT IMPACT**

**WHITE-TAILED DEER
DAMAGE MANAGEMENT IN MARYLAND**

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA APHIS), Wildlife Services (WS) program responds to requests for assistance from individuals, organizations and agencies experiencing damage caused by wildlife. Ordinarily, according to APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions may be categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6000-6003, 1995). To evaluate and determine if any potentially significant impacts to the human environment from WS' planned and proposed program would occur, an environmental assessment (EA) was prepared. The EA documents the need for white-tailed deer (*Odocoileus virginianus*) damage management in Maryland and assessed potential impacts of various alternatives for responding to damage problems. The EA analyzes the potential environmental and social effects for resolving deer damage related to the protection of resources, and health and safety on private and public lands in Maryland. WS' proposed action is to implement an Integrated Wildlife Damage Management (IWDM) program on public and private lands in Maryland. Comments from the public involvement process were reviewed for substantive issues and alternatives which were considered in developing this decision.

WS is the Federal program authorized by law to reduce damage caused by wildlife (Act of March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426c) and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426c), and the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2001, Public Law 106-387, October 28, 2000. Stat. 1549 (Sec 767). Wildlife damage management is the alleviation of damage or other problems caused by or related to the presence of wildlife, and is recognized as an integral part of wildlife management (The Wildlife Society 1992). WS uses an IWDM approach, commonly known as Integrated Pest Management (WS Directive 2.105) in which a combination of methods may be used or recommended to reduce damage. WS wildlife damage management is not based on punishing offending animals but as one means of reducing damage and is used as part of the WS Decision Model (Slate et al. 1992, USDA 1997, WS Directive 2.201). The imminent threat of damage or loss of resources is often deemed sufficient for wildlife damage management actions to be initiated (U.S. District Court of Utah 1993). Resource management agencies, organizations, associations, groups, and individuals have requested WS to conduct deer damage management to protect resources and human health and safety in Maryland. All WS wildlife damage management activities are in compliance with relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act of 1973.

Consistency

The analyses in the EA demonstrate that Alternative 5: 1) best addresses the issues identified in the EA, 2) provides safeguards for public health and safety, 3) provides WS the best opportunity to reduce damage while providing low impacts on non-target species, 4) balances the economic effects to agricultural and natural resources, and property, and 5) allows WS to meet its obligations to government agencies or other entities.

Monitoring

The Maryland WS program will annually provide to the Maryland Department of Natural Resources the WS lethal take of target and non-target animals to help ensure the total statewide take (WS and other take) does not impact the viability of target and non target wildlife species. In addition, the EA will be reviewed each year to ensure that it and the analysis are sufficient.

Public Involvement

The pre-decisional EA was prepared and released to the public for a 34-day comment period by a legal notice in the *Baltimore Sun*. The Legal Notice was placed in the newspaper for three days (December 3, 6 and 7, 2004). A letter of availability for the pre-decisional EA was also mailed directly to agencies, organizations, and individuals with probable interest in the proposed program. A total of 30 comment documents were received from the public during the comment period. All comments were analyzed to identify substantial new issues, alternatives, or to re-direct the program. Responses to specific comments are included in Appendix A. Based upon these comments, several minor editorial changes have been incorporated into the EA. These minor changes enhanced the understanding of the proposed program, but did not change the analysis provided in the EA. All letters are maintained in the administrative file located at the Wildlife Services State Office in Annapolis, Maryland.

Major Issues

The EA describes the alternatives considered and evaluated using the identified issues. The following issues were identified as important to the scope of the analysis (40 CFR 1508.25).

- Effects on White-tailed Deer Populations
- Effects on Plants and Other Wildlife Species, including T&E Species
- Effects on Human Health and Safety
- Humaneness of Methods to be Used
- Effects on Aesthetic Values
- Effects on Regulated White-tailed Deer Hunting

Affected Environment

The areas of the proposed action include, but are not limited to, property on or adjacent to airports, recreational areas, parks, corporate complexes, subdivisions, businesses, industrial parks, schools, agricultural areas, and cemeteries. The proposed action may be conducted on properties held in private, local, state or federal ownership.

Alternatives That Were Fully Evaluated

The following five alternatives were developed to respond to the issues. Two additional alternatives were considered but not analyzed in detail. A detailed discussion of the effects of the Alternatives on the issues is described in the EA; below is a summary of the Alternatives.

Alternative 1: No Deer Damage Management by WS

This alternative would eliminate WS involvement in all deer damage management activities. WS would not provide direct operational or technical assistance and requesters of WS services would have to conduct their own deer damage management without WS input.

Alternative 2: Technical Assistance Only

This alternative would only allow Maryland WS to provide technical assistance to individuals or agencies requesting deer damage management. Individuals might choose to implement WS lethal and non-lethal recommendations, implement methods not recommended by WS, use contractual services of private businesses, or take no action. Appendix B of the EA describes methods available for recommendation by WS under this alternative.

Alternative 3: Lethal Deer Damage Management only by WS

Under this alternative, WS would provide only lethal direct control services and technical assistance. Requests for information regarding non-lethal management approaches would be referred to the Maryland Department of Natural Resources, local animal control agencies, or private businesses or organizations. Individuals might choose to implement WS lethal recommendations, implement non-lethal methods or other methods not recommended by WS, contract for WS lethal direct control services, use contractual services of private businesses, or take no action. Appendix B of the EA describes lethal methods available for recommendation and use by WS under this alternative.

Alternative 4: Nonlethal Deer Damage Management only by WS

This alternative would require WS to use and recommend non-lethal methods only to resolve all deer damage problems. Requests for information regarding lethal management approaches would be referred to the Maryland Department of Natural Resources, local animal control agencies, or private businesses or organizations. Persons incurring deer damage could still resort to lethal methods or other methods not recommended by WS, use contractual services of private businesses that were available to them, or take no action. Appendix B of the EA describes a number of non-lethal methods available for recommendation and use by WS under this alternative.

Alternative 5: Integrated Deer Damage Management Program: No Action (Preferred Alternative/No Action)

Under this alternative, Wildlife Services would continue the current damage management program that responds to requests for white-tailed deer damage assistance in the State of Maryland. An IWDM approach would be implemented in consultation and coordination with the Maryland Department of Natural Resources to alleviate white-tailed deer damage to agriculture, property, natural resources, and human health and safety on all private and public lands of Maryland where a need exists, a request is received, and funding is available. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, white-tailed deer, other species, and the environment. Under this action, WS would provide

technical assistance and operational damage management, including non-lethal and lethal management methods (see Appendix B of the EA) by applying the WS Decision Model (Slate et al. 1992). When appropriate, habitat modifications, harassment, repellants, and physical exclusion could be recommended and utilized to reduce deer damage. In other situations, deer would be removed as humanely as possible by sharp shooting and live capture followed by euthanasia under permits issued by the Maryland Department of Natural Resources. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. Deer damage management would be conducted in the state, when requested, on private or public property after an *Agreement for Control* or other comparable document has been completed. All deer damage management would be consistent with other uses of the area and would comply with appropriate federal, state and local laws.

Alternative Considered but not Analyzed in Detail:

Live Trapping and Relocation

Under this alternative WS would capture deer alive using cage-type live traps or capture drugs administered by dart gun and then relocate the captured deer to another area. Numerous studies have shown that live-capture and relocation of deer is relatively expensive, time-consuming and inefficient (Ishmael and Rongstad 1984, O'Bryan and McCullough 1985, Diehl 1988, Jones and Witham 1990, Ishmael et al. 1995). Population reduction achieved through capture and relocation is labor intensive and would be costly (\$273-\$2,876/deer) (O'Bryan and McCullough 1985, Bryant and Ishmael 1991). Additionally, relocation frequently results in high mortality rates for deer (Cromwell et. al. 1999, O'Bryan and McCullough 1985, Jones and Witham 1990, Ishmael et. al. 1995). Deer frequently experience physiological trauma during capture and transportation, (capture myopathy) and deer mortality after relocation, from a wide range of causes within the first year, has ranged from 25-89% (Jones and Witham 1990, Mayer et al. 1993). O'Bryan and McCullough (1985) found that only 15% of radio-collared black-tailed deer that were live-captured and relocated from Angel Island, California, survived for one year after relocation. Although relocated deer usually do not return to their location of capture, some do settle in familiar suburban habitats and create nuisance problems for those communities (Bryant and Ishmael 1991). High mortality rates of relocated deer, combined with the manner in which many of these animals die, make it difficult to justify relocation as a humane alternative to lethal removal methods (Bryant and Ishmael 1991). Chemical Capture methods require specialized training and skill. A primary limitation of darting, the limited range at which deer can be effectively hit, is generally less than 40 yards. With modern scoped rifles, however, a skilled sharpshooter can hit the head or neck of a deer for a quick kill out to 200 yards and beyond (although a shot over 200 yards is not very likely). Thus, chemical capture is far less efficient, more labor intensive, and much more costly than lethal removal with rifles.

Translocation of wildlife is discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, potential for disease transfer and difficulties in adapting to new locations or habitats. Also many states no longer permit the interstate transfer of deer due to

recent concerns of chronic wasting disease outbreaks. If CWD is already present in Maryland, relocating deer within the state could serve to vector the disease.

Population stabilization through birth control

Reproductive control is often considered for use where wildlife populations are overabundant and where traditional hunting or lethal control programs are not publicly acceptable (Muller et al. 1997). Use and effectiveness of reproductive control as a wildlife population management tool is limited by population dynamic characteristics (longevity, age at onset of reproduction, population size and biological/cultural carrying capacity, etc.), habitat and environmental factors (isolation of target population, cover types, and access to target individuals, etc.), socioeconomic and other factors. Population modeling indicates that reproductive control is more efficient than lethal control only for some rodent and small bird species with high reproductive rates and low survival rates (Dolbeer 1998). Additionally, the need to treat a sufficiently large number of target animals, multiple treatments, and population dynamics of free-ranging populations place considerable logistic and economic constraints on the adoption of reproduction control technologies as a wildlife management tool for some species.

Reproductive control for wildlife could be accomplished either through sterilization (permanent) or contraception (reversible, initial treatment usually followed by a booster and annual follow-up treatments). Sterilization could be accomplished through: 1. Surgical sterilization (vasectomy, castration, and tubal ligation), 2. Chemosterilization, and 3. Gene therapy. Contraception could be accomplished through: 1. Hormone implantation (synthetic steroids such as progestins), 2. Immunocontraception (contraceptive vaccines), and 3. Oral contraception (progestin administered daily). Research into the use of these techniques would consist of laboratory/pen experimentation to determine and develop the sterilization or contraceptive material or procedure, field trials to develop the delivery system, and field experimentation to determine the effectiveness of the technique in achieving population reduction.

The use of hormones was investigated (Matschke 1976, 1977 a, b, c, 1980, and Roughton 1979), and eventually rejected as an effective and efficient reproductive control technique for deer. Additionally, concerns related to costs and logistics of widespread distribution of drugged baits, dosage control and ingestion of baits by children and nontarget animals make oral contraception (by steroids) largely impractical (Lowery et al. 1993). More recently, Immunocontraception has been studied in various situations and locations, but its potential use appears limited due to considerable constraints regarding treatment and follow-up treatment of a sufficiently large number of target animals, varying immunogenicity of vaccines, genetic backgrounds of individual animals, age, nutritional status, stress and other factors (Becker et al. 1997, Becker et al. 1999). The use of porcine zona pellucida (PZP) as a contraceptive agent in wildlife management has been investigated recently (Kirkpatrick et al. 1990, Turner and Kirkpatrick 1991, Turner et al. 1992, and Turner et al. 1996), but to date, there is no published documentation that immunocontraceptive vaccines have successfully reduced any free-ranging white-tailed deer herd or population.

Turner et al. (1993) noted that although contraception in white-tailed deer may be used to limit population growth, it will not reduce the number of deer in excess of the desired level in many circumstances. They further contend that initial population reductions by various other means may be necessary to achieve management goals, and that reproduction control would be one facet of an

integrated program. In sum, although immunocontraceptive technology has been variously effective in laboratories, pens, and in island field applications, it has not been effective in reducing populations of free-ranging white-tailed deer.

The use of this method would be subject to approval by Federal and State Agencies. This alternative was not considered in detail because:

- it would take a number of years of implementation before the deer population would decline and therefore, damage would continue at the present unacceptable levels for a number of years;
- surgical sterilization would have to be conducted by licensed veterinarians, and would therefore be extremely expensive;
- it is difficult, time-consuming, and expensive to effectively live trap, chemically capture, or remotely treat the number of deer necessary to effect an eventual decline in the population; and
- State and Federal regulatory authorities have approved no chemical or biological agent for use as a deer contraceptive.

Finding of No Significant Impact

The analysis in the EA indicates that there will not be a significant impact, individually or cumulatively, on the quality of the human environment as a result of this proposed action. I agree with this conclusion and therefore find that an EIS need not be prepared. This determination is based on the following factors:

1. White-tailed deer damage management as conducted by WS in Maryland is not regional or national in scope.
2. The proposed action would pose minimal risk to public health and safety. Risks to the public from WS methods were determined to be low in a formal risk assessment (USDA 1997, Appendix P).
3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected. Built-in mitigation measures that are part of WS's standard operating procedures and adherence to laws and regulations will further ensure that WS activities do not harm the environment.
4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to wildlife damage management, this action is not highly controversial in terms of size, nature, or effect.
5. Based on the analysis documented in the EA and the accompanying administrative file, the effects of the proposed damage management program on the human environment would

not be significant. The effects of the proposed activities are not highly uncertain and do not involve unique or unknown risks.

6. The proposed action would not establish a precedent for any future action with significant effects.
7. No significant cumulative effects were identified through this assessment. The number of deer killed by WS, when added to the total known other take, would fall within population management objectives established by the Maryland Department of Natural Resources. The EA discussed cumulative effects of WS on target and non-target species populations and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State.
8. The proposed activities would not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural, or historical resources.
9. WS has determined that the proposed project would not adversely affect any Federal or Maryland State listed threatened or endangered species.
10. The proposed action would be in compliance with all federal, state, and local laws.

Decision and Rationale

I have carefully reviewed the Environmental Assessment prepared for this proposal and the input from the public involvement process. I believe that the issues identified in the EA are best addressed by selecting Alternative 5 (Integrated Deer Damage Management Program (Preferred Alternative/No Action) and applying the associated mitigation measures discussed in Chapter 3 of the EA. Alternative 5 is selected because (1) it offers the greatest chance at maximizing effectiveness and benefits to resource owners and managers while minimizing cumulative impacts on the quality of the human environment that might result from the program's effect on target and non-target species populations; (2) it presents the greatest chance of maximizing net benefits while minimizing adverse impacts to public health and safety; and, (3) it offers a balanced approach to the issues of humaneness and aesthetics when all facets of these issues are considered. The comments identified from public involvement were minor and did not change the analysis. Therefore, it is my decision to implement the preferred alternative as described in the EA.

Copies of the EA are available upon request from the Maryland Wildlife Services Office, 1568 Whitehall Road, Annapolis, MD 21401.



Charles S. Brown, Regional Director
APHIS-WS Eastern Region

10/6/05
Date

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Appendix A
Response to Comments to the Environmental Assessment
“White-tailed Deer Damage Management in Maryland”

Issue 1: *Lethal control measures are ineffective at reducing deer damage and are only a short-term solution.*

Program Response 1: As described in the proposed action, lethal control is only part of an integrated wildlife damage management approach that WS will use to manage white-tailed deer damage and conflicts in Maryland. When practical and effective, WS will consider the use of non-lethal methods as part of an overall management scheme. WS recognizes that a reduction of a local deer population or deer herd is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. While lethal control may only have a temporary short-term effect in many circumstances, this may be the only effective management approach available at a site specific location. At times lethal control may be the only option available to effectively and efficiently reduce damage to acceptable levels. The decision on when and how a lethal management approach may be implemented will be based upon the Decision Model described in section 3.3.5 of the EA. As shown in section 3.4.3 of the EA, lethal control measures have been effective at reducing deer damage and conflicts in Maryland. Therefore, as appropriate, lethal control measures will continue to be used and recommend by WS to reduce white-tailed deer damage in Maryland.

Issue 2: *Non-lethal control measures should be used to reduce deer damage and conflicts.*

Program Response 2: As described in the proposed action, WS will consider the use of non-lethal methods as part of an overall management scheme when determined practical and effective for a given situation. Non-lethal methods may be used or recommend as the only method or may be used in combination with lethal control measures to obtain the desired results for a specific project. At times, non-lethal methods may be ineffective at reducing damage and conflicts to acceptable levels. The decision on what types of methods to use or recommend will be based upon the Decision Model described in section 3.3.5 of the EA. As appropriate, non-lethal control measures will continue to be used and recommend by WS to reduce white-tailed deer damage in Maryland.

Issue 3: *The public should be educated on how to co-exist with deer.*

Program Response 3: As described in section 3.3.4 of the EA, WS considers education an important component of the WS deer damage management program in Maryland. Under the proposed program, WS will continue to provide outreach materials and educational opportunities to residents of Maryland on how to co-exist with deer.

Issue 4: *The proposed deer damage management program will cause a wide spread decline in the deer population.*

Program Response 4: As analyzed in section 4.2 of the EA, the proposed WS deer damage management program will have minimal impacts on the overall white-tailed deer population in Maryland. No WS deer damage management activities are, or will be, conducted in such a manner to eradicate or cause a wide spread decline in the native white-tailed deer population throughout the state. WS operates according to international, federal, and state laws and regulations enacted to ensure species viability. In addition, any reduction of a local population or herd is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. The impacts of the current WS program on biodiversity are minor and not significant nationwide, statewide, or region wide (USDA 1997). WS operates on a small percentage of the land area of the State. The maximum number of deer that may be removed by WS is a small percentage of the total population (3.79% of the statewide deer population) and is insignificant to the viability and health of the deer population.

Issue 5: *Killing deer is immoral and unethical.*

Program Response 5: As described in sections 2.2.4 and 2.2.5 of the EA, WS recognizes that people have wide and varying opinions and beliefs regarding WS use of lethal control methods. Maryland WS personnel are experienced and professional in their use of lethal management methods so that they are as humane as possible under the constraints of current technology and funding. Standard Operating Procedures used to maximize humaneness are listed in Chapter 3 of the EA. As appropriate, WS euthanizes animals live captured by methods recommended by the AVMA (Beaver et al. 2001) or the recommendations of a veterinarian.

Issue 6: *Killing deer causes compensatory reproduction effects in deer and leads to an endless cycle of killing as deer populations continue to rebound.*

Program Response 6: White-tailed deer do not exhibit self-regulatory mechanisms whereby compensatory reproduction (increased production of fawns) occurs following population reductions (accomplished through shooting, hunting, or other mechanisms) when the free-ranging population is well below biological carrying capacity (Keith 1974, Wagner et al. 1995). Maryland deer populations are below biological carrying capacity throughout most of the state (Brian Eyler; MDNR Personal Comm.). Removal of deer by WS would not likely result in compensatory reproduction in remaining does. Alternately, compensatory reproduction may have occurred elsewhere/in the past where fenced deer populations occurred at or above biological carrying capacity, and where population control measures were taken. In sum, compensatory reproduction is not expected to follow the proposed removal of deer by WS, since the deer population is well below biological carrying capacity, and the deer population is not currently limited by competition for food, space, water, and/or breeding opportunities.

Issue 7: *There is no evidence that the proposed deer damage management program is effective at reducing deer damage and conflicts.*

Program Response 7: As described in section 3.4.3 of the EA, WS deer damage management activities have been effective in reducing deer damage and conflicts in Maryland.

Issue 8: *Wild free-ranging deer have the right to exist in Maryland and should not be killed.*

Program Response 8: White-tailed deer are a protected natural resource in Maryland. The Maryland Department of Natural Resources, under the direction of the Wildlife Advisory Commission, is specifically charged by the General Assembly with the management of the state's wildlife resources. The primary statutory authorities include the protection, reproduction, care, management, survival, and regulation of wild animal populations regardless of whether the wild animals are present on public or private property in Maryland (COMAR 2-10-202-210). The MDNR has authority to manage deer in the State of Maryland under Title 10-202, and Title 10-206. Under Title 10-206 the MDNR has the authority to permit the taking of deer to resolve damage problems covering this proposed action. (Title 10-202.: In general. – The Secretary is responsible for conservation ; Title 10-206.: When Department may reduce wildlife in identifiable areas. The Department may reduce) (Michies Annotated Code of Maryland 2004). As described in the proposed action, WS lethal deer damage management activities will be conducted under permits issued by the MDNR. All deer damage management activities conducted by WS would be consistent with other uses of the area and would comply with appropriate federal, state and local laws.

Issue 9: *Killing deer does not reduce the risk of Lyme Disease because not enough ticks are removed from the environment.*

Program Response 9: Currently, the most common disease involving deer is Lyme disease, caused by the spirochete *Borrelia burgdorferi* and transmitted to humans by the deer tick (*Ixodes dammini* in the eastern U.S.) (Conover 1997). As many as 500 adult ticks may parasitize a single deer (Piesman et al. 1979, Anderson and Magnarelli 1980, Main et al. 1981, Schulze et al. 1984). Wilson et al. (1985, 1988) and Anderson et al. (1987) found that islands with deer contained active populations of *I. dammini* and *B. burgdorferi*-infected ticks, whereas islands without deer did not.

The spatial correlation between the abundance of deer ticks and that of deer was tested in an experiment that involved the virtual elimination of an isolated deer herd in Massachusetts, resulting in decreased abundance of *I. dammini* (Wilson et al. 1988). Incidence of human infection by the agent of Lyme disease in that site thereafter was reduced (unpublished data, Sam Telford III, personal communication in Deblinger et al. 1993). Although, according to Deblinger et al. (1993), a gradual reduction of deer density failed to produce a rapid, precipitous decline in immature tick abundance. Five to seven years after the initial intervention, immature *I. dammini* densities had declined to levels roughly one-half of that observed before intervention. Therefore, they conclude that ecological component of risk of Lyme disease has been reduced to about half that of levels before intervention.

Issue 10: *Hunting of deer already occurs in Maryland, so why is it necessary to extend management practices to include an additional number of deer.*

Program Response 10: Deer hunting is regulated by the MDNR and is a valuable management tool to assist the state in maintaining a healthy and productive deer herd. While regulated deer hunting may at times be used to reduce damage and conflicts at a local level, at times it may not be available for use due to local ordinances and laws prohibiting such activities or hunting may not be

allowed at the time of year that damage is occurring. In these circumstances and others, MDNR has the legal authority to issue permits to lethally remove deer that are causing damage and conflicts. Section 1.7 of the EA provides information on pertinent laws and regulations that WS uses to manage deer damage in Maryland.

Issue 11: *If deer are allowed to self-regulate damage will not occur.*

Program Response 11: As described in section 1.4.2 of the EA, the ability for a deer population to self-regulate is based upon the deer's biological carrying capacity (BCC) for a given area. The BCC of a wildlife population is defined as the maximum number of animals that an area can support without degradation to the animal's health and the environment over an extended period of time. When this number is exceeded, the health of the population begins to suffer, reproduction declines, parasitism and disease increase, and habitat quality and diversity decrease due to overbrowsing of plant species preferred as food by deer (Kroll et al. 1986). Overbrowsing negatively impacts the habitat and landscape, and overall animal health declines due to less nutritious food items being available. Damage and conflicts currently occur in Maryland even though deer populations are below biological carrying capacity throughout most of the state (Brian Eyler; MDNR Personal Comm.). Therefore, it is reasonable to conclude that if deer were allowed to self-regulate to the point that they would reach their BCC, deer damage and conflicts would not cease but likely occur at higher rates.

Issue 12: *Human encroachment on woodlands, farmlands and other deer habitats is the real reason deer are causing damage and conflicts in Maryland.*

Program Response 12: This issue is outside the scope of this EA and WS legislative authority. WS has no authority to regulate land use practices in the state of Maryland.

Issue 13: *Contraceptives should be used to control deer populations. Birth control alternative is inappropriately dismissed.*

Program Response 13: The use of reproductive control to manage deer damage is discussed in section 3.5.2 of the EA.

USDA National Wildlife Research Center (NWRC) scientists have developed GonaCon™, a new single dose immunocontraceptive vaccine that shows great promise as a wildlife infertility agent. Recent studies have demonstrated the efficacy of this single-shot GnRH vaccine on California ground squirrels, Norway rats, feral cats and dogs, feral swine, wild horses and white-tailed deer. Infertility among treated female swine and white-tailed deer lasted up to 2 years without requiring a booster vaccination. This vaccine overcomes one of the major obstacles of previous two dose vaccines, the need to only capture animals once to vaccinate them. A single-injection vaccine is much more practical as a field delivery system for use on free-ranging animals.

Ongoing studies initiated by NWRC in 2004, are examining the practicality of administering GonaCon™ to free-ranging white-tailed deer as well as the efficacy, toxicity and safety of the vaccine. No fertility control agents have been approved by FDA for non-investigational use on wildlife populations in the U.S. Several materials, however, including GnRH and PZP vaccines,

have been classified as investigational drugs that may be used only in rigidly controlled research studies. NWRC studies that are underway at several locations are being conducted as pivotal studies that are required as part of FDA's approval process for a new animal drug.

The single-shot, multiyear vaccine will be a useful technique for the management of enclosed or urban/suburban deer populations. However, GonaConTM still has limitations, especially the need to capture and inject each animal.

Scientists are hopeful that the GnRH vaccine will soon be approved for wildlife fertility control. If and when this vaccine is proven effective and safe to use for free-ranging white-tailed deer in Maryland, this EA and its analysis would be supplemented pursuant to NEPA at that time.

Issue 14: *Killing deer in unsafe and hazardous to the public.*

Program Response 14: This issue is analyzed in detail in Chapter 4 of the EA. A formal risk assessment of WS's operational management methods found that risks to human safety from the use of lethal deer damage management methods were low (USDA 1997, Appendix P). Therefore, no significant impacts on human safety from WS's use of these methods are expected. Firearms and chemical immobilizing and euthanasia drugs are only used by WS personnel who are experienced in handling and using them. WS personnel receive safety training on a periodic basis to keep them aware of safety concerns. The Maryland WS program has had no accidents involving the use of lethal control methods in which any person was harmed.

Issue 15: *Wildlife Services should use and recommend the most up to date and effective methods available for preventing and resolving conflicts between humans and deer.*

Program Response 15: WS uses and recommends the most up to date and effective methods available for preventing and resolving conflicts between humans and deer. WS personnel receive information and training on a periodic basis to keep them aware new methods and techniques that become available for use in the wildlife damage management arena. Furthermore, the National Wildlife Research Center (NWRC) functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management. As new effective methods become available, the Maryland WS will consider them for potential use in managing deer damage and conflicts throughout the state.

Issue 16: *Natural predators should be re-introduced to resolve deer damage and conflicts.*

Program Response 16: The Eastern Timber Wolf (*Canus latrans*) and the Eastern Puma (*Felis concolor cougar*) are known predators of white-tailed deer. The reintroduction of these animals to Maryland is outside of the scope of this EA and WS' jurisdiction. The authority to approve reintroduction of the predatory animals to Maryland, is the responsibility of wildlife management agencies such as MDNR and/or the U.S. Fish and Wildlife Service.

Issue 17: *The scope of the EA is too broad in terms of geographic region affected by the proposed action.*

Program Response 17: Some individuals question whether preparing an EA for an area as large as the State of Maryland would meet the NEPA requirements for site specificity. In terms of considering cumulative impacts, one EA analyzing impacts for the entire State may provide a better analysis than multiple EA's covering smaller zones. In addition, Maryland WS only conducts deer damage management in small areas of the State where damage is occurring or likely to occur.

Issue 18: *The EA fails to fully explain what procedures WS will use to evaluate damage.*

Program Response 18: As described in Section 3.3.5 of the EA, WS uses a Decision Model (Slate et al. 1992) to evaluate damage at the site specific level. In assessing the damage, immediate attention is given to confirming the type of damage and that damage was caused by white-tailed deer. Commonly this requires an inspection, depending on the type and complexity of the problem. Then severity of the problem is considered in deciding which management options are potentially applicable. Once the problem assessment is completed, all available methods are evaluated for their practicality.

Issue 19: *The EA fails to sufficiently describe how WS will respond to requests for assistance; How does WS decide which management approach to use. What incentives or disincentives does WS consider when deciding on a management approach.*

Program Response 19: As described in Section 3.3.5 of the EA, WS uses a Decision Model (Slate et al. 1992) to determine the appropriate course of action to reduce deer damage and conflicts at the site specific level. WS personnel assess the problem and evaluate the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are developed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy.

Issue 20: *The EA overstates the potential risks of disease transmission from deer to humans and livestock.*

Program Response 20: As summarized in section 1.4.8 of the EA, white-tailed deer have the potential to spread and transmit diseases to humans and livestock. Even though some of these diseases currently do not occur in Maryland, the potential risks are real. Since WS may be requested to assist in managing deer populations to reduce the spread of diseases, WS believes that a discussion of the potential risks associated with wildlife diseases is appropriate and well within the scope of this document. WS discussion of potential disease risks is not overstated and is presented to inform the decision maker of the types of diseases for which WS assistance may be requested.

Issue 21: *There is no evidence that reducing deer numbers reduces deer-vehicle collisions.*

Program Response 21: As summarized in section 1.4.5 of the EA, deer-vehicle collisions are a serious concern in Maryland. The estimated annual total cost to repair vehicle damage from deer-vehicle collisions from 1986-2000 in Maryland was \$28,000,000 (Drake et. al 2003). A reduction of a local deer population may very well reduce the number of deer-vehicle collisions if a sufficient number of animals are removed from an area (Schwabe et al. 2002; J.W. Butfiloski, Pers. Comm. in Hederson et al. 2000). Upon receiving a request for this type of assistance, WS will assess the project site to determine the appropriate course of action to take to reduce deer-vehicle collisions, including a reduction in the local deer population. Depending on the site specific circumstances, lethal removal of deer may be the appropriate course of action to effectively reduce deer-vehicle collisions at a site specific location. It is reasonable to conclude that if deer densities are reduced in an area that has a high rate of deer vehicle collisions, the number of collisions would also decline due to the lower likelihood of a driver coming in contact with a deer.

Issue 22: *Increases in recreational hunting has not been shown to be effective at significantly reducing deer numbers or shifting deer distributions sufficiently to alleviate damage or perceived risks.*

Program Response 22: Deer hunting is regulated by the MDNR and is a valuable management tool to assist the state in maintaining a healthy and productive deer herd. Depending upon the local circumstances, hunting may be used to reduce damage and conflicts at a local level. This type of management approach has been shown be successful on a localized basis (Kilpatrick et al. 2002). The success or failure of hunting in reducing damage and conflicts can be quite variable dependent upon the location that it is used, the hunting methods available, the skills of the hunter, and other damage management strategies being used in the area. While sport hunting is not appropriate for all situations, it may be recommended as part of a management strategy when determined practical and effective for a given situation.

Issue 23: *The EA fails to evaluate an alternative that would require all feasible and practical non-lethal methods to be exhausted before turning to lethal control.*

Program Response 23: This alternative is similar to the proposed action alternative. Under the proposed alternative, an IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, white-tailed deer, other species, and the environment. Under this action, WS would provide technical assistance and operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, habitat modifications, harassment, repellants, and physical exclusion could be recommended and utilized to reduce deer damage. In other situations, deer would be removed as humanely as possible by sharp shooting and live capture followed by euthanasia under permits issued by the Maryland Department of Natural Resources. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal

and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy.

Issue 24: *Management methods of capture and restraining deer are inhumane and may cause undue pain and suffering.*

Program Response 24: As described in sections 2.2.4 and 2.2.5 of the EA, WS recognizes that people have wide and varying opinions and beliefs regarding WS use of control methods. Maryland WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology and funding. Standard Operating Procedures used to maximize humaneness are listed in Chapter 3 of the EA.